MEMORY READ STROBE PULSE OPTIMIZATION TRAINING SYSTEM
Armen D. Avakian et al.
Docket No. EMC2-159PUS

1/6

FIG. 1

MEMORY READ STROBE PULSE OPTIMIZATION TRAINING SYSTEM
Armen D. Avakian et al.
Docket No. EMC2-159PUS

2/6

FIG. 2

MEMORY READ STROBE PULSE OPTIMIZATION TRAINING SYSTEM
Armen D. Avakian et al.
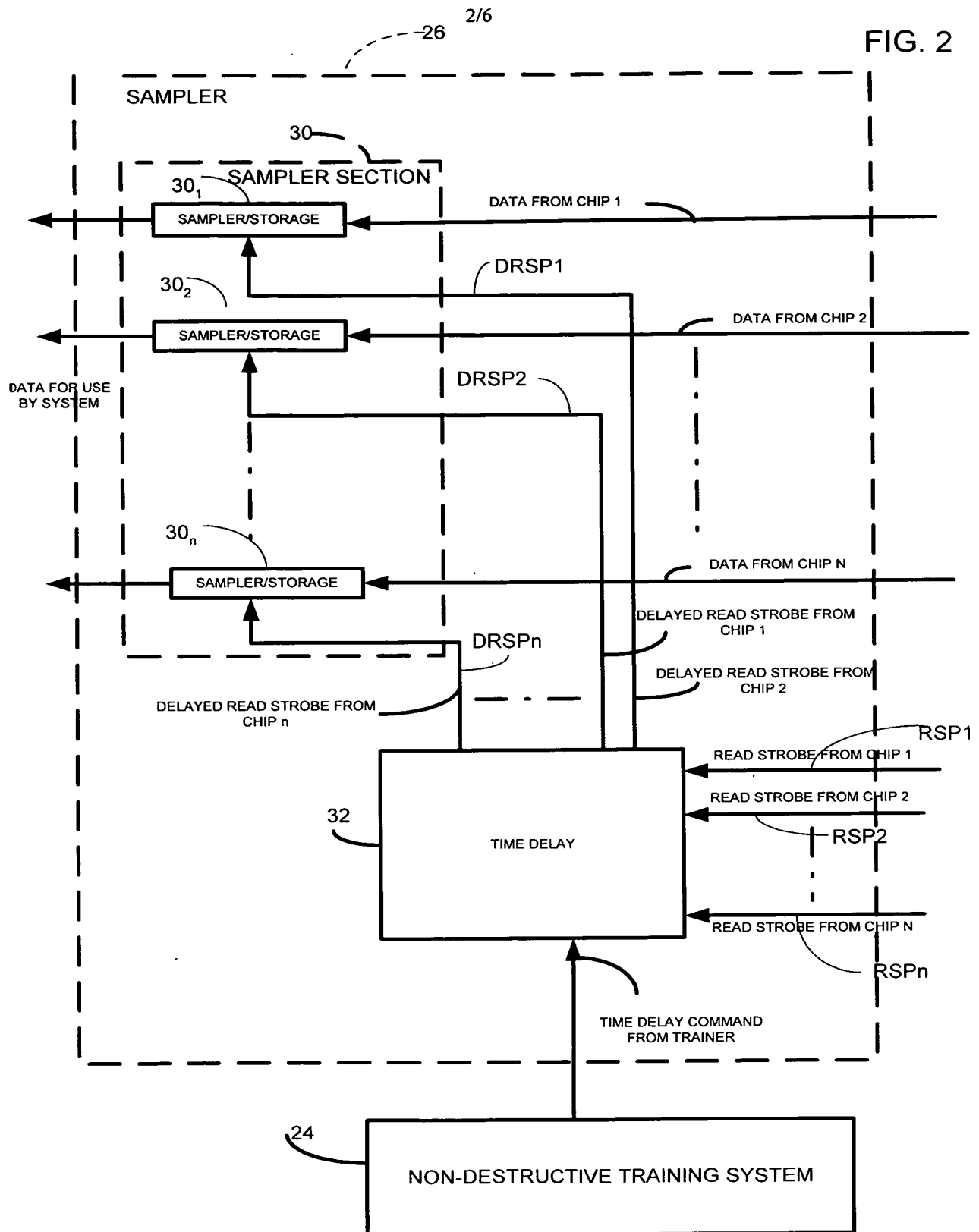Docket No. EMC2-159PUS

3/6

FIG. 2A

WITHOUT TRAINING TO OPTIMIZE DELAY APPLIED TO ALL READ STROBE PULSES WHICH ENABLES INVALID DATA TO BE STORED IN SAMPLING REGISTERS OF BOTH CHIP 1 AND CHIP 2

FIG. 2B

WITH TRAINING TO OPTIMIZE DELAY APPLIED TO ALL READ STROBE PULSES WHICH ENABLES VALID DATA TO BE STORED IN SAMPLING REGISTERS OF BOTH CHIP 1 AND CHIP 2

MEMORY READ STROBE PULSE OPTIMIZATION TRAINING SYSTEM
Armen D. Avakian et al.
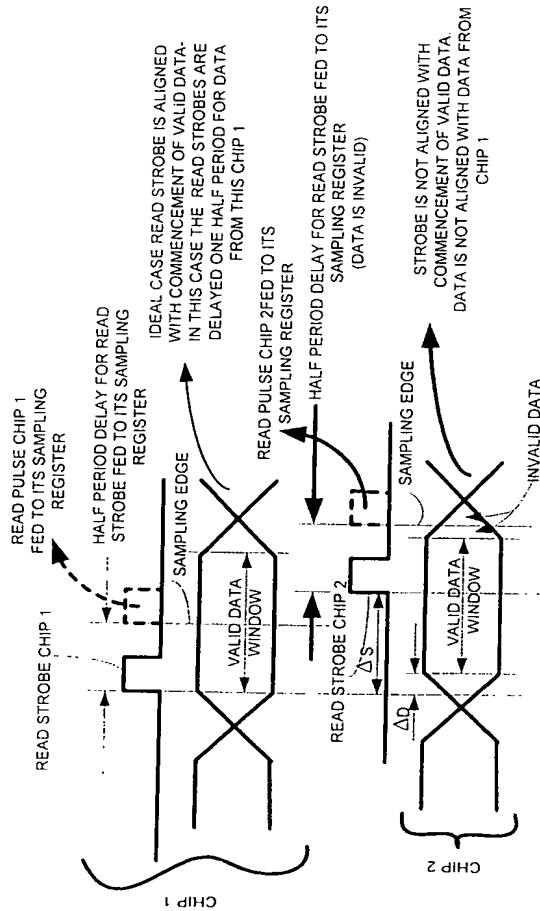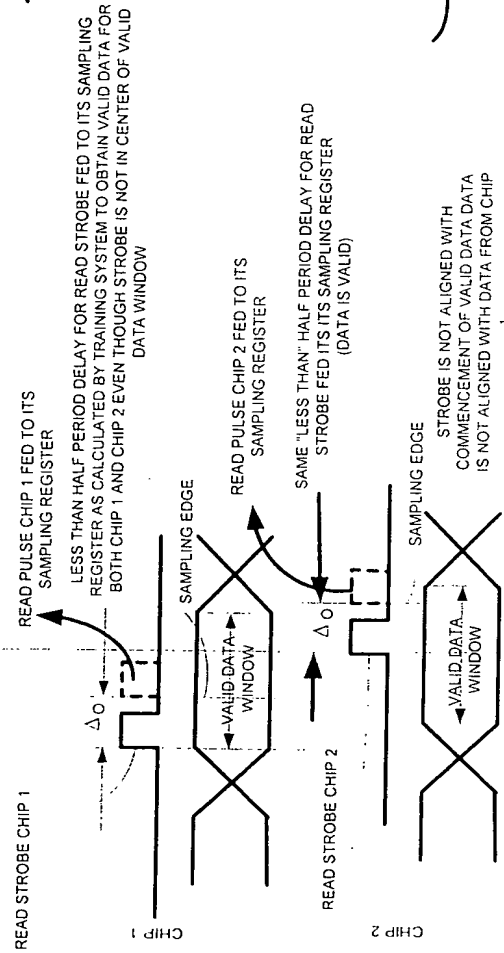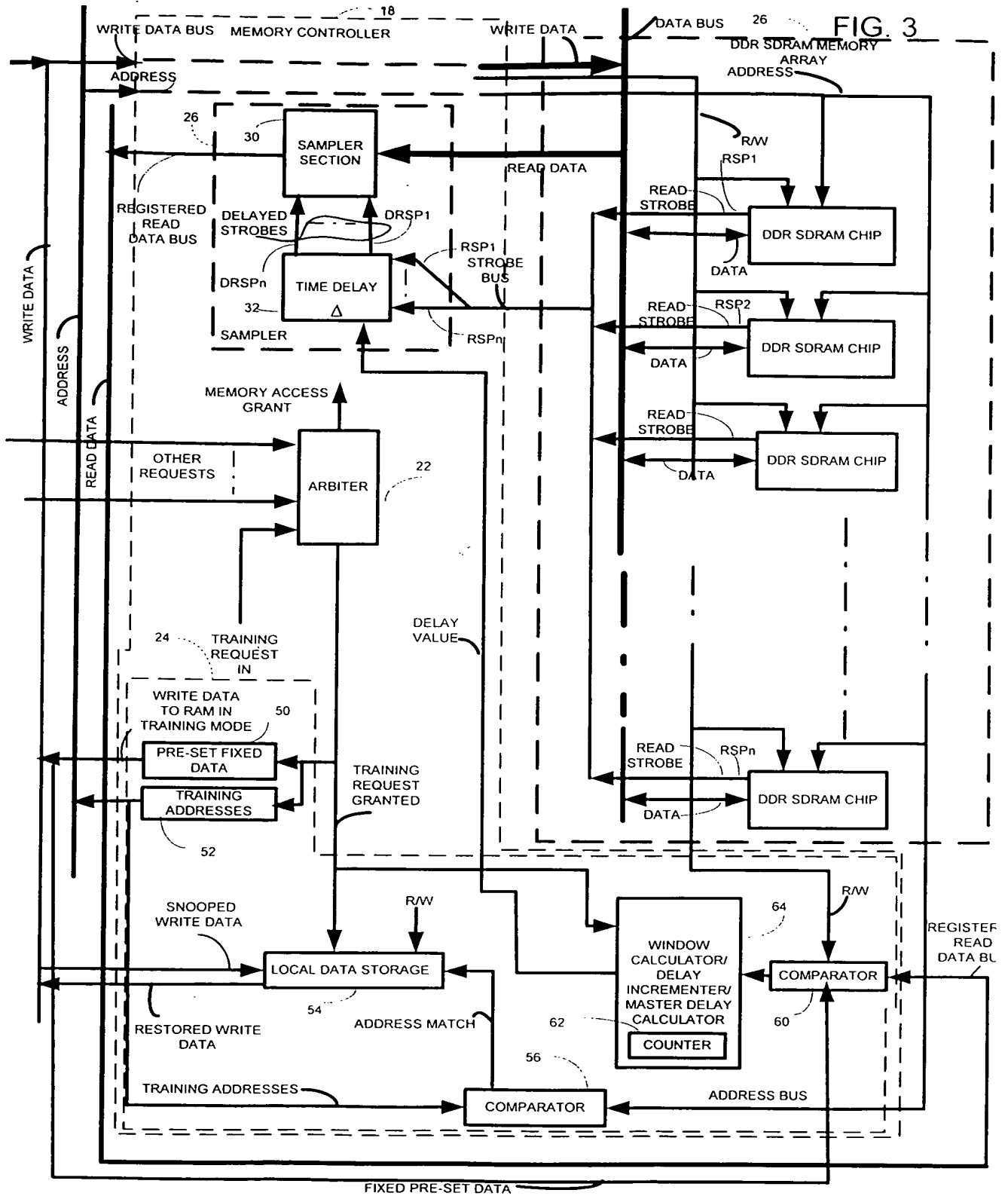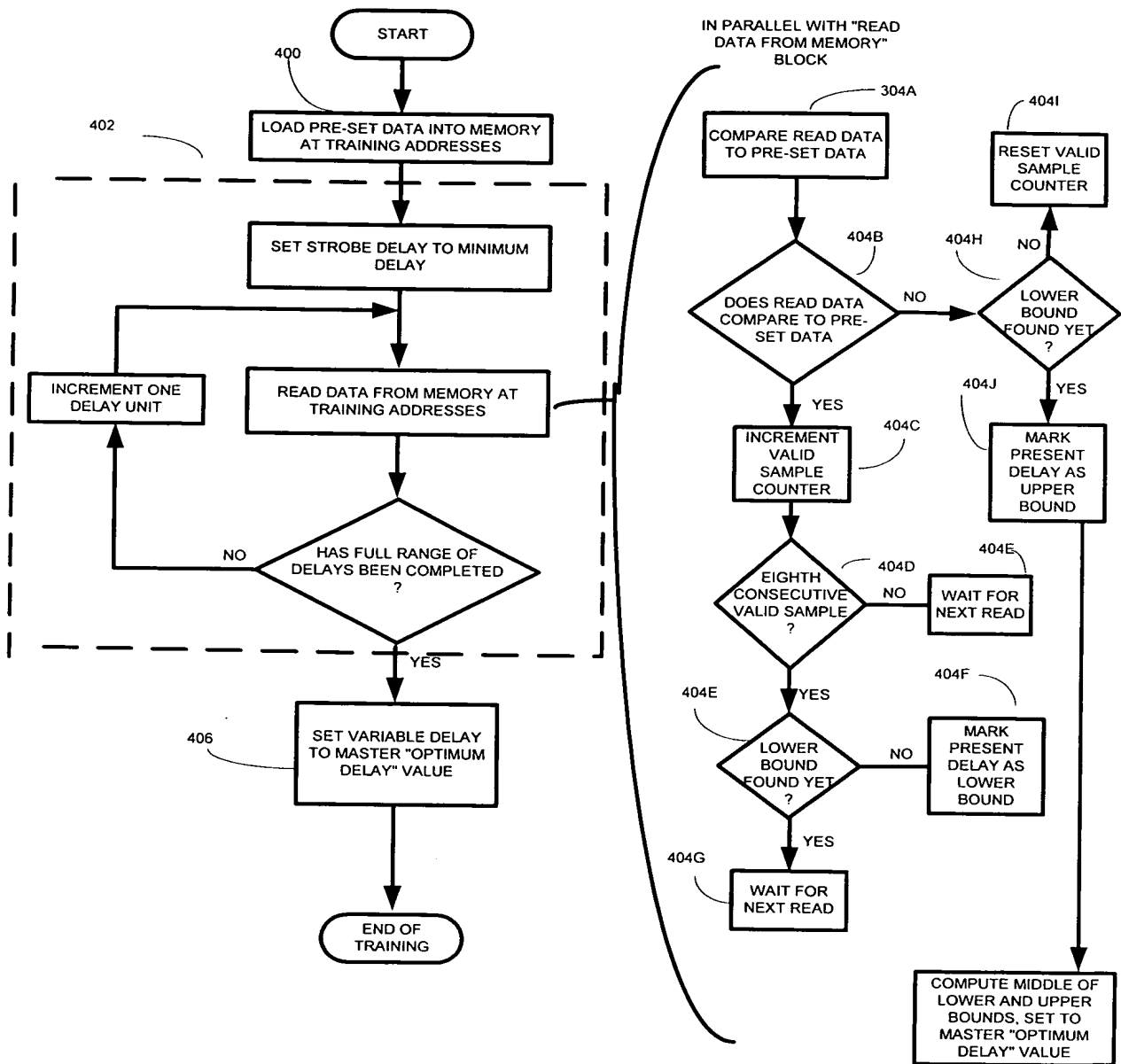Docket No. EMC2-159PUS

4/6

FIG. 3

MEMORY READ STROBE PULSE OPTIMIZATION TRAINING SYSTEM
Armen D. Avakian et al.
Docket No. EMC2-159PUS

5/6

FIG. 4

```
                              START  ─── 400
                                │
                                ▼
402 ─┐      ┌─────────────────────────────────────┐
     │      │  LOAD PRE-SET DATA INTO MEMORY        │
     │      │      AT TRAINING ADDRESSES            │
┌ ─ ─│─ ─ ─ ─ ─ ─ ─ ─│─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ┐
│             ▼
│          ┌─────────────────────────┐
│          │  SET STROBE DELAY TO     │
│          │    MINIMUM DELAY         │
│          └─────────────────────────┘
│             │
│   ┌──────────────┐         ▼
│   │ INCREMENT ONE│   ┌─────────────────────────┐
│   │  DELAY UNIT  │──▶│  READ DATA FROM MEMORY   │
│   └──────────────┘   │    AT TRAINING ADDRESSES │
│        ▲             └─────────────────────────┘
│        │                   │
│        │  NO               ▼
│        └──────────  HAS FULL RANGE OF
│                     DELAYS BEEN COMPLETED ?
│                           │
└ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ │ ─ ─ ─ ─ ─ ─ ─ ─ ─ ┘
                          YES│
                             ▼
406 ─┐  ┌─────────────────────────┐
     │  │  SET VARIABLE DELAY      │
     └─▶│  TO MASTER "OPTIMUM      │
        │    DELAY" VALUE          │
        └─────────────────────────┘
                   │
                   ▼
              END OF TRAINING
```

IN PARALLEL WITH "READ DATA FROM MEMORY" BLOCK

```
304A ─┐
      ▼
┌─────────────────────┐              4041 ─┐
│ COMPARE READ DATA   │                    ▼
│   TO PRE-SET DATA   │           ┌──────────────┐
└─────────────────────┘           │ RESET VALID  │
      │                           │   SAMPLE     │
      ▼          404B             │   COUNTER    │
   DOES READ DATA                 └──────────────┘
   COMPARE TO PRE-   ──NO──▶  404H ─┐    ▲
   SET DATA                         ▼    │ NO
      │                        LOWER BOUND
   YES│                        FOUND YET ?
      ▼                             │
┌──────────────┐  404C            YES│
│ INCREMENT    │                     ▼
│ VALID SAMPLE │             ┌──────────────┐ 404J
│  COUNTER     │             │ MARK PRESENT │
└──────────────┘             │ DELAY AS     │
      │                      │ UPPER BOUND  │
      ▼     404D    404E ─┐  └──────────────┘
   EIGHTH              ▼          │
   CONSECUTIVE ──NO──▶ WAIT FOR   │
   VALID SAMPLE ?      NEXT READ  │
      │                           │
   YES│  404E ─┐       404F ─┐    │
      ▼        │             ▼    │
   LOWER                ┌──────────────┐
   BOUND   ──NO──▶      │ MARK PRESENT │
   FOUND YET ?          │ DELAY AS     │
      │                 │ LOWER BOUND  │
   YES│                 └──────────────┘
      ▼   404G ─┐
   WAIT FOR     │
   NEXT READ    │
                ▼
        ┌─────────────────────┐
        │ COMPUTE MIDDLE OF    │
        │ LOWER AND UPPER      │
        │ BOUNDS, SET TO       │
        │ MASTER "OPTIMUM      │
        │ DELAY" VALUE         │
        └─────────────────────┘
```

MEMORY READ STROBE PULSE OPTIMIZATION TRAINING SYSTEM
Armen D. Avakian et al.
Docket No. EMC2-159PUS

6/6

FIG. 5